

APPENDIX B-III

LIQUID WASTE INCINERATOR MONITORING EQUIPMENT
CALIBRATION AND TESTING PLAN

B-III-1

B151

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LIQUID WASTE INCINERATOR MONITORING EQUIPMENT CALIBRATION AND TESTING PLAN

1.0 INTRODUCTION

This purpose of the liquid waste incinerator monitoring equipment calibration and testing plan is to assure that the instruments and analyzers used for monitoring the liquid waste incinerator operating parameters related to combustion, air pollution control and flue gas composition are functional and are accurately measuring their associated parameters. This plan includes descriptions of the monitoring equipment and systems to be maintained and provides summaries of the calibration procedures and schedules.

2.0 KEY PROCESS MONITORING INSTRUMENTS

The key process monitoring instruments for the liquid waste incinerator (LWI) are listed in Table 2-1. Each instrument type and it's monitoring purpose are identified in the table.

3.0 PROCESS INSTRUMENT CALIBRATIONS

The LWI instruments used for measuring process temperatures, pressures, flow rates, pH, and voltage are calibrated according to the procedures summarized in Table 3-1. The stack gas Continuous Emission Monitoring (CEM) system is calibrated according to the procedures and frequencies summarized in Table 3-2. A copy OCC's CEM Quality Assurance Manual, which includes detailed procedures for calibration of system components, is maintained current and available for inspection and review in the LWI.

The instrument calibrations are scheduled to be performed in accordance with Module V of the permit.

Table 2 - 1. Key Process Monitoring Instruments

| Process Parameter | Instrument Type | Monitoring Purpose |
|---|------------------------------|--|
| Liquid Waste Feed Rate (WT-201 - 204, FIT-546) | Mass Flowmeter | Total mass feed rate limit for selected constituents, AWFCO |
| Absorber/Condenser recycle liquid flow rate (FIT-681) | Magnetic Flowmeter | Proper Absorber/Condenser Operation, AWFCO |
| IWS Recycle Liquid Flow Rate (FIT-745, FIT-775) | Magnetic Flowmeter | Proper IWS operation, AWFCO |
| APC System Purge Flow Rate (FIT-712, 321, 322, 325) | Magnetic Flowmeter | Proper APC System operation |
| Stack Gas Flow Rate (FIT-409) | Pitot Tube | Indication of combustion gas residence time, AWFCO |
| Steam Flow Rate (FIT-101, FIT-201) | Orifice Meter | Indication of combustion gas flow rate, AWFCO |
| Combustion Air Flow Rate (FIT-210) | Pitot Tube | Indication of combustion gas residence time, AWFCO |
| Combustion Chamber Exit Temperature (TT-204) | Thermocouple | Minimum temperature for organic destruction, Maximum temperature to minimize metals emissions, AWFCO |
| Quench Outlet Temperature (TT-626) | Thermocouple | Proper Quench operation, protection of down stream equipment, AWFCO |
| Combustion Chamber Pressure (PIT-206) | Pressure Transmitter | Control of fugitive emissions, AWFCO |
| Absorber/Condenser Spray Nozzle Pressure (PIT-651) | Pressure Transmitter | Proper Absorber/Condenser operation |
| Compressed Air Supply Pressure (PIT-303) | Pressure Transmitter | Proper atomization of waste |
| APC System Water Supply Pressure (PIT-302) | Pressure Transmitter | Proper APC System operation |
| Absorber/Condenser Recycle Liquid pH (AIT-664) | pH electrode and transmitter | Acid gas control, AWFCO |
| IWS Recycle Liquid pH (AIT-704) | pH electrode and transmitter | Acid gas control |
| Quench Recycle Liquid pH (AIT-630) | pH electrode and transmitter | Acid gas control |
| IWS DC Voltage (ET-721, ET-751) | Voltmeter | Proper IWS operation, AWFCO |
| Stack Gas Carbon Monoxide Concentration (AIT-422, AIT-432) | NDIR | Indication of combustion efficiency, AWFCO |
| Stack Gas Oxygen Concentration (AIT-423, AIT-433) | Paramagnetic | Indication of combustion efficiency, AWFCO |
| Stack Gas Carbon Dioxide Concentration (AIT-421, AIT-431) | NDIR | Indication of combustion efficiency |
| Stack Gas Chlorine Concentration (AIT-424, AIT-434) | Ultraviolet | AWFCO |
| Quench Fresh Water Make-up Flow (FIT-601) | Magnetic Flowmeter | Proper Quench operation, AWFCO |
| Quench Recycle Liquid Flow Rate (FIT-620) | Magnetic Flowmeter | Proper Quench operation |
| Combustion Chamber Body Temperature (TT-203) | Thermocouple | Proper Incinerator operation |

Table 3 - 1. Summary of Process Instrument Calibration Procedures, Acceptance Criteria and Frequency

| Instrument | Type | Calibration Procedure | Acceptance Criteria | Frequency |
|---|--------------------|--|---------------------------|---------------------------|
| FLOW | | | | |
| Liquid Waste | Mass Flowmeter | Flow test the meter with water while collecting flow on calibrated weigh scale. Adjust transmitter output signals for proper flow rate and total indications. | $\pm 1\%$ of actual value | Semi-Annually |
| | | Perform zero adjustment procedure & Interlock Simulation.. | ± 0.2 lbs/min output | Monthly |
| A/C Recycle Liquid IWS Recycle Liquid APC System Purge Quench Recycle Liquid Quench Fresh Water Make-up | Magnetic Flowmeter | Use standard magnetic flow meter calibrator to generate simulated flow signals corresponding to Low, Mid and High values. Adjust transmitter output signal to generate the proper flow rate indication. Remove and clean flow Tube and inspect electrodes | $\pm 1\%$ of actual value | Quarterly Annually |
| Stack Gas Combustion Air | Pitot Tube | Check physical condition and dimensions of primary elements. | $\pm 5\%$ of Span | Annually |
| | | Manual Measurement using a pitot tube. | | Semi-annually |
| | | Impart a known pressure to the differential pressure transmitter and adjust the output signal to produce the corresponding flow rate readout. Repeat at three pressure values spanning the planned flow rates. | | Quarterly |
| Steam feed | Orifice Meter | Check physical condition (wear, dirt accumulation and instillation. Measure orifice bore. Clean and reinstall. | $\pm 5\%$ of Span | Annually |
| | | Impart a known pressure to the differential pressure transmitter and adjust the output signal to produce the corresponding flow rate readout. Repeat at three pressure values spanning the planned flow rates. | | Quarterly |

Table 3 - 1. Summary of Process Instrument Calibration Procedures, Acceptance Criteria and Frequency

| TEMPERATURE | | | | |
|---|------------------------------|---|---------------------------|--|
| Combustion Chamber Exit Combustion Chamber Body Quench Outlet * | Thermocouple | Install new thermocouple. Inspect thermocouple type and condition. Proper installation & wiring. *(calibrated with standard thermocouple in temperature bath over operating range) Use a standard thermocouple simulator to generate a millivolt signal corresponding to Low, Mid and High calibration temperatures and adjust output signal to generate the proper temperature readout. | $\pm 2.5\%$ of span | Annually Semi-Annually Monthly |
| PRESSURE | | | | |
| Combustion Chamber A/C Spray Nozzle Compressed Air Supply APC Water Supply | Pressure Transmitter | Use standard pneumatic pressure calibrator to generate a known pressure to the device and verify the corresponding electronic output signal per data provided by instrument manufacture. | $\pm 2\%$ of Span | Quarterly |
| pH | | | | |
| A/C Recycle Liquid IWS Recycle Liquid Quench Recycle Liquid | PH Electrode and Transmitter | Buffer pH sensor with 4, 7, and 10 pH laboratory standards. Adjust output signal for proper indication. | $\pm 5\%$ of actual value | Two times per week |
| DC VOLTAGE | | | | |
| IWS DC Voltage | Voltmeter | Simulate voltage signal with calibrated standard. Adjust output signal for proper indication. | $\pm 2\%$ of Span | Quarterly |

Revised by NYSDEC June 1999

Table 3-2. Summary of CEMS Calibration Tests and Procedures

| Calibration Test | Description | Frequency |
|--------------------------|---|-----------|
| Daily Calibration Check | System audit and calibration check of the CO, CO ₂ , O ₂ and Cl ₂ monitors performed per the CEMS QA Manual available in the Environmental Control Department. | Daily |
| Weekly Calibration Check | System inspection, sample line integrity check, zero and span calibration checks of the CO, CO ₂ , O ₂ , and Cl ₂ monitors performed per the CEMS QA Manual available in the Environmental Control Department. | Weekly |
| Cylinder Gas Audit | Each monitor will be tested by determining the monitor response to injections at the sample probe of zero-level, mid-level, and high-level calibration gases. Each monitor will be tested three non-consecutive times at each of the three measurement points (total of 9 readings). CO acceptance criteria: ≤ 5% of span CO ₂ acceptance criteria: ≤ 2% of span O ₂ acceptance criteria: ≤ 2% of span Cl ₂ acceptance criteria: ≤ 10% of span | Quarterly |
| Calibration Drift Test | Demonstrates stability of monitor response with time. The difference between monitor response and two calibration standard gases (zero-level and high-level) is determined at 24-hour intervals for 7 consecutive days. CO acceptance criteria: ≤ 3% of span CO ₂ acceptance criteria: ≤ 2% of span O ₂ acceptance criteria: ≤ 2% of span Cl ₂ acceptance criteria: ≤ 5% of span | Annual |
| Relative Accuracy Test | Provides independent verification of CEMS ability to provide accurate data and validates calibration technique. The process CEMS responses are measured and compared to the responses obtained using an EPA reference method (RM) for the determination. CO acceptance criteria: ≤ the greater of 10% of the RM or 10 ppmv CO ₂ acceptance criteria: ≤ 10% of the RM O ₂ acceptance criteria: incorporated into CO relative accuracy test Cl ₂ acceptance criteria: ≤ 20% of the RM or 10 ppmv | Annual |
| Response Time Test | Measures time interval required for CEMS to respond to a change in combustion gas concentrations. CO acceptance criteria: ≤ 2 minutes to reach 95% of stable value CO ₂ acceptance criteria: ≤ 2 minutes to reach 95% of stable value O ₂ acceptance criteria: ≤ 2 minutes to reach 95% of stable value Cl ₂ acceptance criteria: ≤ 2 minutes to reach 95% of stable value | Annual |

4.0 AUTOMATIC WASTE FEED CUTOFF (AWFCO) TESTING

Testing of the AWFCO system is performed to verify that the incinerator system can be shutdown in an emergency in order to minimize any impact on on-site workers, the general public and the environment, and to minimize damage to the incinerator. Testing of the AWFCO system is performed as outlined in Table 4-1. For additional information, OCC's Liquid Waste Incinerator Interlock Testing Procedure, is maintained current and available for inspection and review in the Area Maintenance Foreman's office.

| Table 4-1. AWFCO Testing Summary | |
|---|---|
| Parameter | Simulate Input and Verify DCS Trip of Waste Feed Pump |
| Combustion chamber exit gas temperature (TI-204) | Semi-monthly (2 nd and 4 th weeks by Schedule) |
| Combustion chamber pressure (PI-206) | Semi-monthly |
| Liquid waste feed rate (WT-202 - WT-205, FIT-546) | Semi-monthly |
| Combustion air flow (FIC-210) | Semi-monthly |
| Steam flow rate (FIC-101 - FIC-102) | Semi-monthly |
| Quench exit gas temperature (TI-204, TI-626) | Semi-monthly |
| Absorber/condenser recycle liquid flow rate (FIT-681) | Semi-monthly |
| Absorber/condenser pH (AIC-664) | Semi-monthly |
| IWS DC voltage (ET-721B, ET-751B) | Semi-monthly |
| IWS recycle liquid flow rate (FIT-745, FIT-775) | Semi-monthly |
| Stack gas Cl ₂ (High) (AIT-424, AIT-434) | Semi-monthly |
| Stack gas CO (Maximum Average) (AIT-422, AIT-432) | Semi-monthly |
| Stack gas O ₂ (Low) (AIT-423, AIT-433) | Semi-monthly |

If the incinerator is not routinely operating due to repair or overhaul, all of the automatic waste feed cutoff parameters listed in Table 4-1 will be functionally tested prior to start-up of the incinerator.

5.0 DOCUMENTATION PROCEDURES

Records are retained for three (3) years. The daily checklists and daily calibration results of analyzers are maintained by the LWI Operations Supervisor. The Maintenance Department retains copies of the following documents:

- 1) Semi-monthly test records of the AWFCO system alarms and system interlocks
- 2) Weekly calibration results of pH monitors
- 3) Monthly/Quarterly/Annual calibration of monitor/sensor systems
- 4) Equipment Maintenance Log book located in the LWI Control Room.

5.1 RESPONSIBILITY FOR COMPLETING AND FILING OF FORMS

The maintenance mechanics and instrument personnel who perform the instrument calibrations have the responsibility for clearly and accurately completing the individual checklists and logbook entries used for documenting work activities on the LWI process control system.

Sheet 1

GENERAL CALIBRATION PROCEDURES:

- 1 **FLOW ORIFICE:** A': Inspect orifice for wear, accumulation and proper installation. Measure orifice bore. Clean and reinstall.
- 2 **AVERAGING PITOT TUBE:** Q: Inspect tubes for wear, accumulation and proper installation. Clean openings and reinstall.
- 3 **DIFFERENTIAL PRESSURE TRANSMITTER:** Q: Use standard pressure calibrator or manometer to generate pressure signals corresponding to Low, Mid and High calibration values. Compare to transmitters response.
- 4 **GAUGE PRESSURE TRANSMITTER:** Q: Use standard pressure calibrator or manometer to generate pressure signals corresponding to Low, Mid and High calibration values. Compare to transmitters response.
- 5 **CORRIOLIS MASS FLOW TRANSMITTER:**
A': Flow test meter with water while collecting flow on a calibrated weigh scale. Compare weight of collected water with totalized flow derived from transmitter signal.
M: Fill sensor with fluid and perform a zero adjustment.
- 6 **MAGNETIC FLOW TRANSMITTER:** A: Use manufacturer's signal/calibration simulator to generate signals corresponding to Low, Mid and High calibration values. Compare to transmitter response. Remove and clean flow tube, inspect electrodes. -
- 7 **THERMOCOUPLE:** A': Inspect thermocouple type, condition, insertion into process line, and wiring to transmitter.
- 8 **T/C TEMPERATURE TRANSMITTER:** A: Use standard thermocouple simulator to generate millivolt signals corresponding to Low, Mid and High calibration values. Compare to transmitters response.
- 9 **pH ELECTRODE AND TRANSMITTER:** 3/W: Clean and inspect pH electrode. Using laboratory standard buffer solutions of 4.0, 7.0 and 10.0 pH, immerse pH electrode and compare to transmitters response.
- 10 **TFE LINED SAMPLE PROBE:**
Q: Clean and inspect sample probe.
A': Verify installation meets requirements as described in section 3.1 of CEMS Performance Specification Test Protocol.
- 11 **SAMPLE CONDITIONING SYSTEM:**
D: Perform system audit.
W: Clean and inspect sample conditioning system. Test operation of all equipment. Leak test system. Setup sample system pressures and flows.
- 12 **NDIR CO ANALYZER/TRANSMITTER:**
D: Perform calibration drift checks.
W: Perform required maintenance.
Q': Perform Cylinder Gas Audit (Calibration Error Test) as described in Appendix F of 40 CFR 60.
A': Perform testing as described in the CEMS Performance Specification Test Protocol.
- 13 **PARAMAGNETIC O2 ANALYZER/TRANSMITTER:**
D: Perform calibration drift checks.
W: Perform required system maintenance.
Q': Perform Cylinder Gas Audit (Calibration Error Test) as described in Appendix F of 40 CFR 60.
A': Perform testing as described in the CEMS Performance Specification Test Protocol.
- 14 **NDIR CO2 ANALYZER/TRANSMITTER:**
D: Perform calibration drift checks.
W: Perform required system maintenance.
Q': Perform Cylinder Gas Audit (Calibration Error Test) as described in Appendix F of 40 CFR 60.
A': Perform testing as described in the CEMS Performance Specification Test Protocol.
- 15 **UV Cl2 ANALYZER/TRANSMITTER:**
D: Perform calibration drift checks.
W: Perform required system maintenance.
Q': Perform Cylinder Gas Audit (Calibration Error Test) as described in Appendix F of 40 CFR 60.
A': Perform testing as described in the CEMS Performance Specification Test Protocol.
- 16 **IR CO ANALYZER:** W: Automatic daily calibration drift check. Perform system audit and required maintenance.
- 17 **CURRENT TRANSMITTER:** A: Use standard voltage calibrator to generate signals corresponding to Low, Mid and High calibration values. Compare to transmitters response.
- 18 **VOLTAGE TRANSMITTER:** A: Use standard current calibrator to generate signals corresponding to Low, Mid and High calibration values. Compare to transmitters response.

LWI PH PM PROCEDURE

LWIPHPM.DOC

SAFETY PRECAUTIONS:

____ Wear proper PPE

____ Before any electrical or mechanical equipment is worked on ensure all energy sources associated with the equipment under repair is properly locked out by all maintenance personnel involved in the job.

COORDINATION:

____ Ensure coordination with operations to minimize process upsets and to to have operations sign in on the work order.

____ All AIC's need to be placed in manual by the operator before commencing PM procedure.

PROCEDURE:

| RANGE | TAG | PROCESS | CALIBRATION | AS LEFT | | | PROBE REPLACED Y/N |
|---------|---------|----------------|-------------|---------|-----|------|-----------------------|
| | | | | 4PH | 7PH | 10PH | |
| 2-12 PH | AI-SPR3 | U-82 SPARE | 4PH=7.2mA | | | | |
| | AI-303 | ADAMS AVE | 7PH=12mA | | | | |
| | AI-304 | #2 NEUT. | 12PH=16.8mA | | | | |
| | AIC-320 | #1 NEUT. | | | | | |
| | AI-SPR2 | U-82 SPARE | | | | | |
| | AI-820 | COOL TWR | | | | | |
| | AIC-704 | IWS | | | | | |
| | AIC-664 | ABSORB/COND | | | | | |
| 0-14 PH | AI-SPR1 | U-82 SPARE | 4 PH=8.5mA | | | | |
| | AIC-614 | QUENCH SUMP | 7PH=12mA | | | | |
| | AIC-630 | QUENCH BWDN | 12PH=15.4mA | | | | |
| | AIC-103 | PRI. ADJ. TANK | | | | | |
| | AIC-104 | SEC. ADJ. TANK | | | | | |
| | AIC-106 | NEUT. REACTOR | | | | | |

____ Using above table, PH Transmitter Instruction Manual, and PH Buffer solutions. Pull each probe, check it for accuracy vs. Buffer solutions and adjust or replace probe as necessary.

| | |
|------------------------------|-------------|
| PHEONIX PH PROBE -15FT. LONG | 11-34951034 |
| HORIBA PH PROBE | 11-33644560 |
| SENSOREX HF RESISTANT PROBE | 11-33644503 |

CRAFTSMAN _____

DATE _____

SUPERVISOR _____

DATE _____

FACILITY : 11 DEPT: FES BLDG: E1 690 21563 01
AREA/LOC : OPER/CEMS LWI OPERATOR / CONTINUOUS EMISSIONS WORK ORDER
UNIT : LWI LIQUID WASTE INCINERATOR (690) =====
EQUIPMENT: IWSS0610 CEM ANALYZER DUEL SYSTEM CONT MON 11121563 01
FIN/POS : =====
MANUFACT.: MODEL :
SERIAL NO: SPIN : COST CNTR: 11690
INITIATOR: UHNPDM PLANNER : UHNPDXC
JOB TYPE : PM PRIORITY: 3 NEED DATE: 12-25-2025

WORK ORDER STATUS : PLAN
WORK ORDER DESCRIPTION: LWI, MONTHLY PM (PCS)

TASK STATUS : PLAN
TASK DESCRIPTION : LWI MONTHLY PM (PCS)

CRAFT STAFF REQUIRED
MSEL 2
MSIN 6

EXPANDED TASK DESCRIPTION:

PERFORM CEM MONTHLY PM OUTLINED IN PROCEDURE LOCATED IN V41 10/23/98 UHNPJWP
INSTRUMENTATION FOREMAN OFFICE. BE SURE BE SURE TO PERFORM 10/23/98 UHNPJWP
NOVA CO ANALYZER MONTHLY PM, FILL OUT CHECK SHEET COMPLETELY 11/05/98 UHNPDM
WITH 'PEN' AND RETURN TO FOREMAN FOR REVIEW. 10/23/98 UHNPJWP
***** 10/23/98 UHNPJWP
COORDINATE WITH OPERATIONS AND OBSERVE STD. ELECTRICAL 10/23/98 UHNPJWP
AND INSTRUMENT SAFETY PRECAUTIONS 10/23/98 UHNPJWP
***** 10/23/98 UHNPJWP

FIELD SIGN-IN:

| | | | | | |
|------------------------|---|-------|---------------|---|-------|
| EQUIP.OWNER'S INITIALS | : | _____ | DATE/TIME IN | : | _____ |
| EQUIP.OWNER'S INITIALS | : | _____ | DATE/TIME OUT | : | _____ |
| EQUIP.OWNER'S INITIALS | : | _____ | DATE/TIME IN | : | _____ |
| EQUIP.OWNER'S INITIALS | : | _____ | DATE/TIME OUT | : | _____ |
| EQUIP.OWNER'S INITIALS | : | _____ | DATE/TIME IN | : | _____ |
| EQUIP.OWNER'S INITIALS | : | _____ | DATE/TIME OUT | : | _____ |
| EQUIP.OWNER'S INITIALS | : | _____ | DATE/TIME IN | : | _____ |
| EQUIP.OWNER'S INITIALS | : | _____ | DATE/TIME OUT | : | _____ |
| EQUIP.OWNER'S INITIALS | : | _____ | DATE/TIME IN | : | _____ |
| EQUIP.OWNER'S INITIALS | : | _____ | DATE/TIME OUT | : | _____ |

REPLACEMENT:

SPIN : _____ MANUFACT.: _____
MODEL: _____ SERIAL : _____

M121. COMPLETION COMMENTS AND REPAIR RECOMMENDATIONS:

IS A NEW WORK REQUEST REQUIRED ? (Y/N) ____ NEED BY __/__/__

PRINTED: 11-11-1998

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LWI MONTHLY PM & CHECK SHEET (INST.)

CEMMONTHb.DOC

SAFETY PRECAUTIONS:

____ Wear proper PPE

____ Before any electrical or mechanical equipment is worked on ensure all energy sources associated with the equipment under repair is properly locked out by all maintenance personnel involved in the job.

COORDINATION:

____ Ensure coordination with operations to minimize process upsets and to to have operations sign in on the work order.

____ Coordinate with INSTRUMENT & ELECTRICAL foreman to accomplish during sensor checks each month.

PROCEDURE:

MASS FLOW TRANSMITTERS

REFERENCE: LWI QA/QC PLAN, MICROMOTION EQUIPMENT MANUALS

____ Perform zero procedure on the following coriolis mass flow meters.
(WE/WIT-201,-202,-203,-204,-205, FE/FIT-546)

PRESSURE TRANSMITTERS

REFERENCE: LWI QA/QC PLAN , PRESSURE TRANSMITTER INSTRUCTION MANUAL

____ Remove the following differential pressure transmitters from service.
(FIT-101,-201,-210)

____ Remove the following gauge pressure transmitters from service.
(PIT-206,-302)

____ Using a standard pressure calibrator, generate pressure signals corresponding to the low, mid, and high calibration values, and compare to transmitters. Adjust as necessary.

TEMPERATURE TRANSMITTERS

REFERENCE: LWI QA/QC PLAN, TEMPERATURE TRANSMITTER INSTRUCTION MANUAL

____ Remove thermocouple and transmitters from service.
(TE/TT-203,-203A,-204)

____ Check & replace if necessary, Te-203,-203a,-204 with T/C from stores. (11-34017003 24" OR 11-34017402 30")

NOVA CO ANALYZER MONTHLY

REFERENCE: NOVA CO ANALYZER INSTRUCTION MANUAL

SAFETY PRECAUTIONS:

- _____ Wear proper PPE, cl2, hcl, and pcbtc, are associated with these vessels.
- _____ Before any electrical or mechanical equipment is worked on ensure all energy sources associated with the vessel and lamp under repair is properly locked out by all maintenance personnel involved in the job.

PROCEDURE:

- _____ Inspect all tubing and connections for cracks , leaks, and repair as necessary.
- _____ Replace the bowl filter element at the sample inlet to the analyzer. P/N 11-30150004
- _____ Turn down the sample flow to the analyzer and replace the liquid block filter inside the analyzer. P/N 11-30150008
- _____ With the analyzer running normally shut off the water flow to the gas separator and ensure the low water flow lamp on the front of the analyzer illuminates. Return water flow to normal and ensure the lamp goes back out.
- _____ With the analyzer running normally, close the sample flow control valve on the front of the analyzer, and ensure the low sample flow lamp on the front of the analyzer illuminates. Return sample flow to normal and ensure the lamp goes back out.
- _____ Ensure the cal gas and nitrogen gas regulators inside the cabinet are set correctly.
 - Cal gas 2-5 psig _____
 - Nitrogen 2-5 psig _____
- _____ Using the equipment manual, put the instrument through a manual cal. Both zero and span gas should be run through the instrument.

CRAFTSMAN _____

DATE _____

SUPERVISOR _____

DATE _____

LWI MONTHLY PM & CHECK SHEET(ELEC.)

CEMMONThe.DOC

SAFETY PRECAUTIONS:

____ Wear proper PPE

____ Before any electrical or mechanical equipment is worked on ensure all energy sources associated with the equipment under repair is properly locked out by all maintenance personnel involved in the job.

CAUTION: THIS PM MUST BE ACCOMPLISHED WHEN THE 25KV IS DOWN. BEST TIME TO ACCOMPLISH IS DURING MONTHLY SENSOR CHECKS.

REFERENCE LWI OPERATING PROCEDURES SECTION 7 IWS AND STACK FOR PROPER IWS SHUTDOWN PROCEDURES

COORDINATION:

____ Ensure coordination with operations to minimize process upsets and to to have operations sign in on the work order.

____ Coordinate with INSTRUMENT & ELECTRICAL foreman to accomplish during sensor checks each month.

PROCEDURE:

DASHPOT IN IWS 25KV CONTROL CABINET IN MCC (ELECTRICAL)

____ Check and refill as necessary the dashpot oil in the current trip relay, within the control unit, used for starting up the 25kv during startup. Note above reference to IWS procedures manual for proper shutdown of IWS electrical system prior to performing this function.

CRAFTSMAN _____

DATE _____

SUPERVISOR _____

DATE _____

MASS FLOW METER ZERO CHECK

LOOP NO.: WT-201
PROCESS: FUEL OIL FEED

DATE: _____

CRAFTSMAN: _____

FOREMAN: _____
ENGINEER: _____

=====

PRIMARY ZERO ADJUSTMENT - FLOW LIQUID THROUGH THE MICROMOTION TUBE
UNTIL THE UNIT IS FULL AND NO AIR IS
ENTRAINED. WITH THE PUMP OFF AND NO FLOW
IN THE MICROMOTION, NOTE AND RECORD THE
COLOR OF THE PZA "LED". ADJUST THE PZA
"POT" UNTIL THE "LED" IS BETWEEN RED AND
GREEN.

"LED" COLOR BEFORE ADJUSTMENT: _____

"LED" COLOR AFTER ADJUSTMENT: _____

=====

DATE ON CALIBRATION STICKER ATTACHED TO TRANSMITTER: _____

COMMENTS: _____

=====

CALIB. EQUIP.

SERIAL NO.

CALIB. DATE

3

MASS FLOW METER ZERO CHECK

LOOP NO.: WT-202
PROCESS: T-6 FEED

DATE: _____

CRAFTSMAN: _____

FOREMAN: _____
ENGINEER: _____

=====

PRIMARY ZERO ADJUSTMENT - FLOW LIQUID THROUGH THE MICROMOTION TUBE UNTIL THE UNIT IS FULL AND NO AIR IS ENTRAINED. WITH THE PUMP OFF AND NO FLOW IN THE MICROMOTION, NOTE AND RECORD THE COLOR OF THE PZA "LED". ADJUST THE PZA "POT" UNTIL THE "LED" IS BETWEEN RED AND GREEN.

"LED" COLOR BEFORE ADJUSTMENT: _____

"LED" COLOR AFTER ADJUSTMENT: _____

=====

DATE ON CALIBRATION STICKER ATTACHED TO TRANSMITTER: _____

COMMENTS: _____

=====

CALIB. EQUIP.

SERIAL NO.

CALIB. DATE

X V

MASS FLOW METER ZERO CHECK

LOOP NO.: WT-203
PROCESS: T-4 FEED

DATE: _____

CRAFTSMAN: _____

FOREMAN: _____
ENGINEER: _____

=====

PRIMARY ZERO ADJUSTMENT - FLOW LIQUID THROUGH THE MICROMOTION TUBE UNTIL THE UNIT IS FULL AND NO AIR IS ENTRAINED. WITH THE PUMP OFF AND NO FLOW IN THE MICROMOTION, NOTE AND RECORD THE COLOR OF THE PZA "LED". ADJUST THE PZA "POT" UNTIL THE "LED" IS BETWEEN RED AND GREEN.

"LED" COLOR BEFORE ADJUSTMENT: _____

"LED" COLOR AFTER ADJUSTMENT: _____

=====

DATE ON CALIBRATION STICKER ATTACHED TO TRANSMITTER: _____

COMMENTS: _____

=====

CALIB. EQUIP.

SERIAL NO.

CALIB. DATE

MASS FLOW METER ZERO CHECK

LOOP NO.: WT-204
PROCESS: T-1 FEED

DATE: _____

CRAFTSMAN: _____

FOREMAN: _____
ENGINEER: _____

=====

PRIMARY ZERO ADJUSTMENT - FLOW LIQUID THROUGH THE MICROMOTION TUBE UNTIL THE UNIT IS FULL AND NO AIR IS ENTRAINED. WITH THE PUMP OFF AND NO FLOW IN THE MICROMOTION, NOTE AND RECORD THE COLOR OF THE PZA "LED". ADJUST THE PZA "POT" UNTIL THE "LED" IS BETWEEN RED AND GREEN.

"LED" COLOR BEFORE ADJUSTMENT: _____

"LED" COLOR AFTER ADJUSTMENT: _____

=====

DATE ON CALIBRATION STICKER ATTACHED TO TRANSMITTER: _____

COMMENTS: _____

=====

| <u>CALIB. EQUIP.</u> | <u>SERIAL NO.</u> | <u>CALIB. DATE</u> |
|----------------------|-------------------|--------------------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |

MASS FLOW METER ZERO CHECK

LOOP NO.: WT-205
PROCESS: T-2/3 FEED

DATE: _____

CRAFTSMAN: _____

FOREMAN: _____
ENGINEER: _____

=====

PRIMARY ZERO ADJUSTMENT - FLOW LIQUID THROUGH THE MICROMOTION TUBE UNTIL THE UNIT IS FULL AND NO AIR IS ENTRAINED. WITH THE PUMP OFF AND NO FLOW IN THE MICROMOTION, NOTE AND RECORD THE COLOR OF THE PZA "LED". ADJUST THE PZA "POT" UNTIL THE "LED" IS BETWEEN RED AND GREEN.

"LED" COLOR BEFORE ADJUSTMENT: _____

"LED" COLOR AFTER ADJUSTMENT: _____

=====

DATE ON CALIBRATION STICKER ATTACHED TO TRANSMITTER: _____

COMMENTS: _____

=====

CALIB. EQUIP.

SERIAL NO.

CALIB. DATE

MASS FLOW METER ZERO CHECK

LOOP NO.: WT-546
PROCESS: T-20 FEED

DATE: _____

CRAFTSMAN: _____

FOREMAN: _____
ENGINEER: _____

=====

PRIMARY ZERO ADJUSTMENT - FLOW LIQUID THROUGH THE MICROMOTION TUBE UNTIL THE UNIT IS FULL AND NO AIR IS ENTRAINED. WITH THE PUMP OFF AND NO FLOW IN THE MICROMOTION, NOTE AND RECORD THE COLOR OF THE PZA "LED". ADJUST THE PZA "POT" UNTIL THE "LED" IS BETWEEN RED AND GREEN.

"LED" COLOR BEFORE ADJUSTMENT: _____

"LED" COLOR AFTER ADJUSTMENT: _____

=====

DATE ON CALIBRATION STICKER ATTACHED TO TRANSMITTER: _____

COMMENTS: _____

=====

CALIB. EQUIP.

SERIAL NO.

CALIB. DATE

500026
ORIFICE STEAM METERS (electronic)
PM REPORT

DATE _____

APPROVED BY: _____

CRAFTSMAN _____

FOREMAN _____

ENGINEER _____

LOOP NUMBER FIT-101

LOCATION LWI STEAM FLOW

| | OK | NOT OK |
|---|--------------------------|--------------------------|
| 1. <u>VISUAL - STEAM LEAKS</u> | | |
| A. TRANSMITTER | <input type="checkbox"/> | <input type="checkbox"/> |
| B. IMPULSE LINES | <input type="checkbox"/> | <input type="checkbox"/> |
| C. VALVES (and/or RESERVOIRS) | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. <u>VISUAL - MECHANICAL DAMAGE OR PROBLEMS</u> | | |
| A. TRANSMITTER and IMPULSE LINES | <input type="checkbox"/> | <input type="checkbox"/> |
| B. INSULATION (intact & complete) | <input type="checkbox"/> | <input type="checkbox"/> |
| C. HEAT TRACING (hot & not leaking) (Nov. to May only) | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. <u>BLEED AIR FROM IMPULSE LINES and/or TRANSMITTER (after calibration)</u> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS: (detail problems found, and what was done to resolve them)

4. TRANSMITTER FIELD CHECK

(taken before starting)----->

| Date | Time | Transm output (ma) | BAILEY Integrator reading |
|------|------|--------------------------|---------------------------------|
|------|------|--------------------------|---------------------------------|

Span = 63.9 "H2O

A. ZERO (0")

EXPECTED

AS FOUND

AS LEFT

| 4.0 |

| |

| |

B. MID RANGE (16")

| 12.0 |

| |

| |

C. FULL SPAN (63.9")

| 20.0 |

| |

| |

(taken after finishing)----->

| Date | Time | Transm output (ma) | BAILEY Integrator reading |
|------|------|--------------------------|---------------------------------|
|------|------|--------------------------|---------------------------------|

Calibration equipment documentation:

| ITEM | MODEL NO. | SERIAL NO. | CALIB. DATE |
|-------|-----------|------------|-------------|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

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500026
ORIFICE STEAM METERS (electronic)
PM REPORT

DATE _____ APPROVED BY: _____
CRAFTSMAN _____ FOREMAN _____
ENGINEER _____

LOOP NUMBER FIT-201

LOCATION LWI STEAM FLOW

| | OK | NOT OK |
|---|----------|----------|
| 1. <u>VISUAL - STEAM LEAKS</u> | | |
| A. TRANSMITTER | _ -- | _ -- |
| B. IMPULSE LINES | _ -- | _ -- |
| C. VALVES (and/or RESERVOIRS) | _ -- | _ -- |
| 2. <u>VISUAL - MECHANICAL DAMAGE OR PROBLEMS</u> | | |
| A. TRANSMITTER and IMPULSE LINES | _ -- | _ -- |
| B. INSULATION (intact & complete) | _ -- | _ -- |
| C. HEAT TRACING (hot & not leaking) (Nov. to May only) | _ -- | _ -- |
| 3. <u>BLEED AIR FROM IMPULSE LINES and/or TRANSMITTER (after calibration)</u> | _ -- | _ -- |

COMMENTS: (detail problems found, and what was done to resolve them)

4. TRANSMITTER FIELD CHECK

(taken before starting)----->

| Date | Time | Transm output (ma) | BAILEY Integrator reading |
|------|------|--------------------------|---------------------------------|
| | | | |

Span = 63.9 "H2O

| | EXPECTED | AS FOUND | AS LEFT |
|-----------------------|----------|----------|---------|
| A. ZERO (0") | 4.0 | | |
| B. MID RANGE (16 ") | 12.0 | | |
| C. FULL SPAN (63.9 ") | 20.0 | | |

(taken after finishing)----->

| Date | Time | Transm output (ma) | BAILEY Integrator reading |
|------|------|--------------------------|---------------------------------|
| | | | |

Calibration equipment documentation:

| ITEM | MODEL NO. | SERIAL NO. | CALIB. DATE |
|------|-----------|------------|-------------|
| | | | |
| | | | |
| | | | |

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LOOP CALIBRATION REPORT SHEET ____ OF ____

*** see glossary on reverse side *** *** attach more sheets if needed ***

DATE _____ Signature of: APPROVALS
CRAFTSMAN _____ FOREMAN _____
_____ ENGINEER _____
AREA LWI SUPERINTENDENT _____

=====

LOOP INFORMATION

LOOP NUMBER EIT-210 LOOP NAME COMB. AIR FLOW EQUIP. # 1274173

| TRANSMITTER INPUT (h ₂ O, psi, mv, other) | TRANSMITTER OUTPUT (ma, psig, other) | SCALE RANGE (controllers, recorders) (engineering units) | If Temp. Transmitter |
|--|--|--|----------------------|
| zero <u>0.0</u> | zero <u>4.0</u> | zero <u>0 SCFM</u> | junc. type _____ |
| mid <u>1.98</u> | mid <u>12.0</u> | mid <u>3889 SCFM</u> | amb. tmp. _____ |
| span <u>3.96</u> | span <u>20.0</u> | span <u>5500 SCFM</u> | amb. mv. _____ |

=====

VISUAL - FOR LEAKS OR DAMAGE

(enter comments for 'NOT OK' or 'CORRECTED')

| | <u>OK</u> | <u>NOT OK</u> | <u>CORRECTED?</u> | |
|--|-----------|---------------|-------------------|-----------|
| | | | <u>YES</u> | <u>NO</u> |

| | | | | |
|-----------------------|-------|-------|-------|-------|
| TRANSMITTER | _____ | _____ | _____ | _____ |
| IMPULSE LINES | _____ | _____ | _____ | _____ |
| INDICATOR AND DEVICES | _____ | _____ | _____ | _____ |
| OTHER | _____ | _____ | _____ | _____ |

=====

CALIBRATION of TRANSMITTER

| <u>INPUT</u> | <u>OUTPUT</u> | |
|--------------|-----------------|----------------|
| | <u>AS FOUND</u> | <u>AS LEFT</u> |
| zero _____ | _____ | _____ |
| mid _____ | _____ | _____ |
| span _____ | _____ | _____ |

CALIBRATION of OTHER LOOP DEVICES
(use engineering units)

| <u>name</u> | | <u>name</u> | | <u>name</u> | |
|--------------|-------------|--------------|-------------|--------------|-------------|
| <u>FOUND</u> | <u>LEFT</u> | <u>FOUND</u> | <u>LEFT</u> | <u>FOUND</u> | <u>LEFT</u> |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |

=====

COMMENTS _____

(cont. on back)

DATE ON OLD CALIBRATION STICKER ATTACHED TO TRANSMITTER/DEVICE _____
DATE ON NEW CALIBRATION STICKER YOU ARE ATTACHING TO TRANSM/DEVICE _____

=====

CALIBRATION EQUIPMENT DOCUMENTATION

| <u>ITEM</u> | <u>MODEL NO.</u> | <u>SERIAL NO.</u> | <u>CALIBR. DATE</u> |
|-------------|------------------|-------------------|---------------------|
|-------------|------------------|-------------------|---------------------|

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LOOP CALIBRATION REPORT SHEET ____ OF ____

*** see glossary on reverse side *** *** attach more sheets if needed ***

DATE _____ Signature of: APPROVALS
CRAFTSMAN _____ FOREMAN _____
ENGINEER _____
AREA LWI SUPERINTENDENT _____

=====

LOOP INFORMATION

LOOP NUMBER PIT-206 LOOP NAME INCIN. BODY PRESS. EQUIP. #. 1272022

| TRANSMITTER INPUT ("h20, psi, mv, other) | TRANSMITTER OUTPUT (ma, psig, other) | SCALE RANGE (controllers, recorders) (engineering units) | If Temp. Transmitter |
|--|--|--|----------------------|
| zero <u>-5.0</u> | zero <u>4.0</u> | zero <u>-5.0" w.c.</u> | junc. type _____ |
| mid <u>0.0</u> | mid <u>12.0</u> | mid <u>0.0" w.c.</u> | amb. tmp. _____ |
| span <u>+5.0</u> | span <u>20.0</u> | span <u>+5.0" w.c.</u> | amb. mv. _____ |

=====

VISUAL - FOR LEAKS OR DAMAGE

(enter comments for 'NOT OK' or 'CORRECTED')

| | OK | NOT OK | CORRECTED? | |
|--|----|--------|------------|----|
| | | | YES | NO |

| | | | | |
|-----------------------|-------|-------|-------|-------|
| TRANSMITTER | _____ | _____ | _____ | _____ |
| IMPULSE LINES | _____ | _____ | _____ | _____ |
| INDICATOR AND DEVICES | _____ | _____ | _____ | _____ |
| OTHER | _____ | _____ | _____ | _____ |

=====

CALIBRATION of TRANSMITTER

| INPUT | OUTPUT AS FOUND AS LEFT | |
|------------|----------------------------|-------|
| zero _____ | _____ | _____ |
| mid _____ | _____ | _____ |
| span _____ | _____ | _____ |

CALIBRATION of OTHER LOOP DEVICES
(use engineering units)

| name _____ | | name _____ | | name _____ | |
|------------|-------|------------|-------|------------|-------|
| FOUND | LEFT | FOUND | LEFT | FOUND | LEFT |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |

=====

COMMENTS _____

(cont. on back)

DATE ON OLD CALIBRATION STICKER ATTACHED TO TRANSMITTER/DEVICE _____
DATE ON NEW CALIBRATION STICKER YOU ARE ATTACHING TO TRANSM/DEVICE _____

=====

CALIBRATION EQUIPMENT DOCUMENTATION

| ITEM | MODEL NO. | SERIAL NO. | CALIBR. DATE |
|------|-----------|------------|--------------|
|------|-----------|------------|--------------|

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LOOP CALIBRATION REPORT SHEET ____ OF ____

*** see glossary on reverse side *** *** attach more sheets if needed ***

DATE _____ Signature of: APPROVALS

CRAFTSMAN _____ FOREMAN _____

_____ ENGINEER _____

AREA LWI SUPERINTENDENT _____

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LOOP INFORMATION - PUT FIC-601 LOOP IN "MANUAL"

LOOP NUMBER PIT-302 LOOP NAME RIVER WATER PRESS. EQUIP. # 1272033

| TRANSMITTER <u>INPUT</u> (<u>"h2o"</u> , psi, mv, other) | TRANSMITTER <u>OUTPUT</u> (<u>ma</u> , psig, other) | <u>SCALE RANGE</u> (controllers, recorders) (engineering units) | If Temp. Transmitter |
|---|--|---|----------------------|
| zero <u>0.0</u> | zero <u>4.0</u> | zero <u>0.0 PSIG</u> | junc. type _____ |
| mid <u>50.0</u> | mid <u>12.0</u> | mid <u>50 PSIG</u> | amb. tmp. _____ |
| span <u>100.0</u> | span <u>20.0</u> | span <u>100 PSIG</u> | amb. mv. _____ |

=====

VISUAL - FOR LEAKS OR DAMAGE

(enter comments for 'NOT OK'
or 'CORRECTED')

| OK | NOT OK | CORRECTED? |
|----|--------|------------|
| | | YES NO |

TRANSMITTER _____

IMPULSE LINES _____

INDICATOR AND DEVICES _____

OTHER _____

=====

CALIBRATION of TRANSMITTER

| <u>INPUT</u> | <u>OUTPUT</u> AS FOUND AS LEFT |
|--------------|-----------------------------------|
| zero _____ | _____ |
| mid _____ | _____ |
| span _____ | _____ |

CALIBRATION of OTHER LOOP DEVICES
(use engineering units)

| name | name | name |
|------------|------------|------------|
| FOUND LEFT | FOUND LEFT | FOUND LEFT |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

=====

COMMENTS _____

(cont. on back)

DATE ON OLD CALIBRATION STICKER ATTACHED TO TRANSMITTER/DEVICE _____

DATE ON NEW CALIBRATION STICKER YOU ARE ATTACHING TO TRANSM/DEVICE _____

=====

CALIBRATION EQUIPMENT DOCUMENTATION

| ITEM | MODEL NO. | SERIAL NO. | CALIBR. DATE |
|------|-----------|------------|--------------|
|------|-----------|------------|--------------|

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LOOP CALIBRATION REPORT SHEET ____ OF ____

* see glossary on reverse side *** *** attach more sheets if needed ***

DATE _____ Signature of: APPROVALS
 CRAFTSMAN _____ FOREMAN _____
 _____ ENGINEER _____
 AREA _____ SUPERINTENDENT _____

LOOP INFORMATION

LOOP NUMBER TT-203 LOOP NAME INCIN BODY TEMP EQUIP. # _____
HIGH RANGE

| TRANSMITTER INPUT | TRANSMITTER OUTPUT | SCALE RANGE | |
|------------------------|--------------------|--------------------------|----------------------|
| ("h2O, psi, av, other) | (ma, psig, other) | (controllers, recorders) | If Temp. Transmitter |
| | | (engineering units) | |
| zero <u>5.582 MV</u> | zero <u>4 MA</u> | zero <u>600 °C</u> | junc. type _____ |
| mid <u>11.846 MV</u> | mid <u>12 MA</u> | mid <u>1100 °C</u> | amb. tap. _____ |
| span <u>18.842 MV</u> | span <u>20 MA</u> | span <u>1600 °C</u> | amb. av. _____ |

VISUAL - FOR LEAKS OR DAMAGE
 (enter comments for 'NOT OK'
 or 'CORRECTED')

| OK | NOT OK | CORRECTED? |
|----|--------|------------|
| | | YES NO |

TRANSMITTER _____
 IMPULSE LINES _____
 INDICATOR AND DEVICES _____
 OTHER _____

CALIBRATION of TRANSMITTER

CALIBRATION of OTHER LOOP DEVICES (use engineering units)

| INPUT | OUTPUT |
|---------------------------|------------------|
| | AS FOUND AS LEFT |
| zero <u>5.582 (600)</u> | _____ |
| mid <u>11.846 (1100)</u> | _____ |
| span <u>18.842 (1600)</u> | _____ |

| name | | name | | name | |
|-------|-------|-------|-------|-------|-------|
| FOUND | LEFT | FOUND | LEFT | FOUND | LEFT |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |

COMMENTS

(cont. on back)

DATE ON OLD CALIBRATION STICKER ATTACHED TO TRANSMITTER/DEVICE _____
 DATE ON NEW CALIBRATION STICKER YOU ARE ATTACHING TO TRANSM/DEVICE _____

CALIBRATION EQUIPMENT DOCUMENTATION

| ITEM | MODEL NO. | SERIAL NO. | CALIBR. DATE |
|------|-----------|------------|--------------|
|------|-----------|------------|--------------|

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LOOP CALIBRATION REPORT SHEET ____ OF ____

* see glossary on reverse side *** *** attach more sheets if needed ***

DATE _____ Signature of: APPROVALS
 CRAFTSMAN _____ FOREMAN _____
 _____ ENGINEER _____
 AREA _____ SUPERINTENDENT _____

LOOP INFORMATION

LOOP NUMBER TT-203A LOOP NAME INGIN. BODY TEMP. EQUIP. # _____
LEIN RANGE

| TRANSMITTER INPUT (^{"h2O, psi, mv, other)} | TRANSMITTER OUTPUT (^{ma, paig, other)} | SCALE RANGE (^{controllers, recorders)} (^{engineering units}) | If Temp. Transmitter |
|--|--|---|----------------------|
| zero <u>0</u> | zero <u>4</u> | zero <u>0 °C</u> | junc. type <u>R</u> |
| mid <u>4.471</u> | mid <u>12</u> | mid <u>500 °C</u> | amb. temp. _____ |
| span <u>10.508</u> | span <u>20</u> | span <u>1000 °C</u> | amb. mv. _____ |

VISUAL - FOR LEAKS OR DAMAGE
 (enter comments for 'NOT OK'
 or 'CORRECTED')

| OK | NOT OK | CORRECTED? |
|----|--------|------------|
| | | YES NO |

TRANSMITTER
 IMPULSE LINES
 INDICATOR AND DEVICES
 OTHER

| | | | |
|-------|-------|-------|-------|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

CALIBRATION of TRANSMITTER

CALIBRATION of OTHER LOOP DEVICES (use engineering units)

| INPUT | OUTPUT AS FOUND AS LEFT |
|---------------------|----------------------------|
| zero <u>0 °C</u> | _____ |
| mid <u>500 °C</u> | _____ |
| span <u>1000 °C</u> | _____ |

| name _____ | | name _____ | | name _____ | |
|------------|-------|------------|-------|------------|-------|
| FOUND | LEFT | FOUND | LEFT | FOUND | LEFT |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |

COMMENTS Note: TT-203 and TT-203A use same thermocouple

(cont. on back)

DATE ON OLD CALIBRATION STICKER ATTACHED TO TRANSMITTER/DEVICE _____
 DATE ON NEW CALIBRATION STICKER YOU ARE ATTACHING TO TRANSM/DEVICE _____

CALIBRATION EQUIPMENT DOCUMENTATION

| ITEM | MODEL NO. | SERIAL NO. | CALIBR. DATE |
|------|-----------|------------|--------------|
|------|-----------|------------|--------------|

| | | | |
|-------|-------|-------|-------|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

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LOOP CALIBRATION REPORT SHEET ____ OF ____

*** see glossary on reverse side *** *** attach more sheets if needed ***

DATE _____ Signature of: APPROVALS
CRAFTSMAN _____ FOREMAN _____
_____ ENGINEER _____
AREA LWI SUPERINTENDENT _____

=====

LOOP INFORMATION

LOOP NUMBER TT-204 LOOP NAME INCIN. EXIT TEMP. EQUIP. # 1271018

| TRANSMITTER INPUT ("h20, psi, (mv), other) | TRANSMITTER OUTPUT (ma, psig, other) | SCALE RANGE (controllers, recorders) (engineering units) | If Temp. Transmitter |
|--|--|--|----------------------|
| zero <u>5.582(600°C)</u> | zero <u>4.0</u> | zero <u>600°C</u> | junc. type <u>R</u> |
| mid <u>11.842(1100°C)</u> | mid <u>12.0</u> | mid <u>1100°C</u> | amb. tmp. _____ |
| span <u>18.842(1600°C)</u> | span <u>20.0</u> | span <u>1600°C</u> | amb. mv. _____ |

=====

VISUAL - FOR LEAKS OR DAMAGE

(enter comments for 'NOT OK'
or 'CORRECTED')

| OK | NOT OK | CORRECTED? | |
|----|--------|------------|----|
| | | YES | NO |

TRANSMITTER _____
IMPULSE LINES _____
INDICATOR AND DEVICES _____
OTHER _____

=====

CALIBRATION of TRANSMITTER

| INPUT | OUTPUT |
|-------|------------------|
| | AS FOUND AS LEFT |

| | | | |
|------|-------|-------|-------|
| zero | _____ | _____ | _____ |
| mid | _____ | _____ | _____ |
| span | _____ | _____ | _____ |

CALIBRATION of OTHER LOOP DEVICES
(use engineering units)

| name | FOUND | LEFT | name | FOUND | LEFT | name | FOUND | LEFT |
|------|-------|------|------|-------|------|------|-------|------|
|------|-------|------|------|-------|------|------|-------|------|

| | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |

=====

COMMENTS _____

(cont. on back)

DATE ON OLD CALIBRATION STICKER ATTACHED TO TRANSMITTER/DEVICE _____
DATE ON NEW CALIBRATION STICKER YOU ARE ATTACHING TO TRANSM/DEVICE _____

=====

CALIBRATION EQUIPMENT DOCUMENTATION

| ITEM | MODEL NO. | SERIAL NO. | CALIBR. DATE |
|------|-----------|------------|--------------|
|------|-----------|------------|--------------|